CurQfen : MediHerb Tumeric Forte /Metagenics vs CurcumRx Biotics Research

Standard Process product contains 60 tablets providing 100 mg of curcumin per tablet from 115.6 turmeric extract. Fenugreek seed extract is also part of the CurQfen as 131.4 mg per tablet. They reference the Kumar article [J Funct Foods 2016; 22,578-587]. That article describes CurQfen as, "Enhanced bioavailability and relative distribution of free curcuminoids following oral administration of a food-grade formulation with fenugreek dietary fiber." Mediherb actually labels the product as their Tumeric Forte and on their tech sheet they list the Kumar study as the only reference for the product. The process is also disclosed in patent application US 2013/0029905 by Kumar et al.

Composition
CurQfen curcuminoids with fenugreek fiber

CurcumRx curcuminoids with tumeric (100% tumeric product)

Patent: CurQfen, pending US 2013/0029905: CurcuminRx method is not filed for patent (trade secret to date)

Concerns from CurQfen patent. Page 4 [0050] "Dried rhizomes of turmeric were powdered and **extracted with mixture of hexane and acetone** and solvent was evaporated with to get a pasty mass called turmeric oleoresin". This raises the concern for testing of each batch to assure that hexane levels comply with USP (United States Pharmacopeia). **Hexane is a class 2 solvent with limits to be no more than 290 mcg per gram (USP). Although hexane is not classified as a carcinogen, it is a neurotoxicant.**

Processes: The CurQfen process states the oleoresin curcumiod is added to an aqueous fenugreek fiber dispersion. The mixture appears to be blended under ultrasound and or homogenization. This dispersion is then dried below 80 C followed by granulation or spray drying.

The process of making CurumRx is stated to use an oleoresin from turmeric prepared by ethanol extraction. The turmeric matrix contains curcuminoids, turmeric essential oil and a water extract of turmeric. The turmeric matrix of CurcumRx supplies 50% curcuminoids. The CurcumRx preparation is spray dried resulting in a final powdered preparation containing 50% curcuminoids.

Differences of composition: The CurQfen pending patent states that the method involves impregnation of curcuminoids in a soluble fiber (fenugreek) matrix to produce microencapsulates. The final composition has particle sizes of 5 microns that contain the dried fibrous gel with curcumin within the particle. The patent application states "Curcumin impregnated soluble fiber were prepared by ultrasound mediated gel-phase microencapsulation of curcuminoids in fiber matrix. 400 grams of curcumin with minimum of 91% purity was suspended in 400 grams of glycerine with sonication using 1000 Watt ultrasound generator for 1 hour at intervals of 10 minutes keeping the temperature below 70° C (158°F). The final product was dried under vacuum and finally milled. Alternatively, the solution can be spray dried. Glycerin maybe expected to be in the finished product as an equal part of the curcuminoids. As a processing aid it may not necessarily have to be on the label. Glycerin is a polyol with a high boiling point (554°F).

Comparison Chart of curcumin absorption reported in the literature

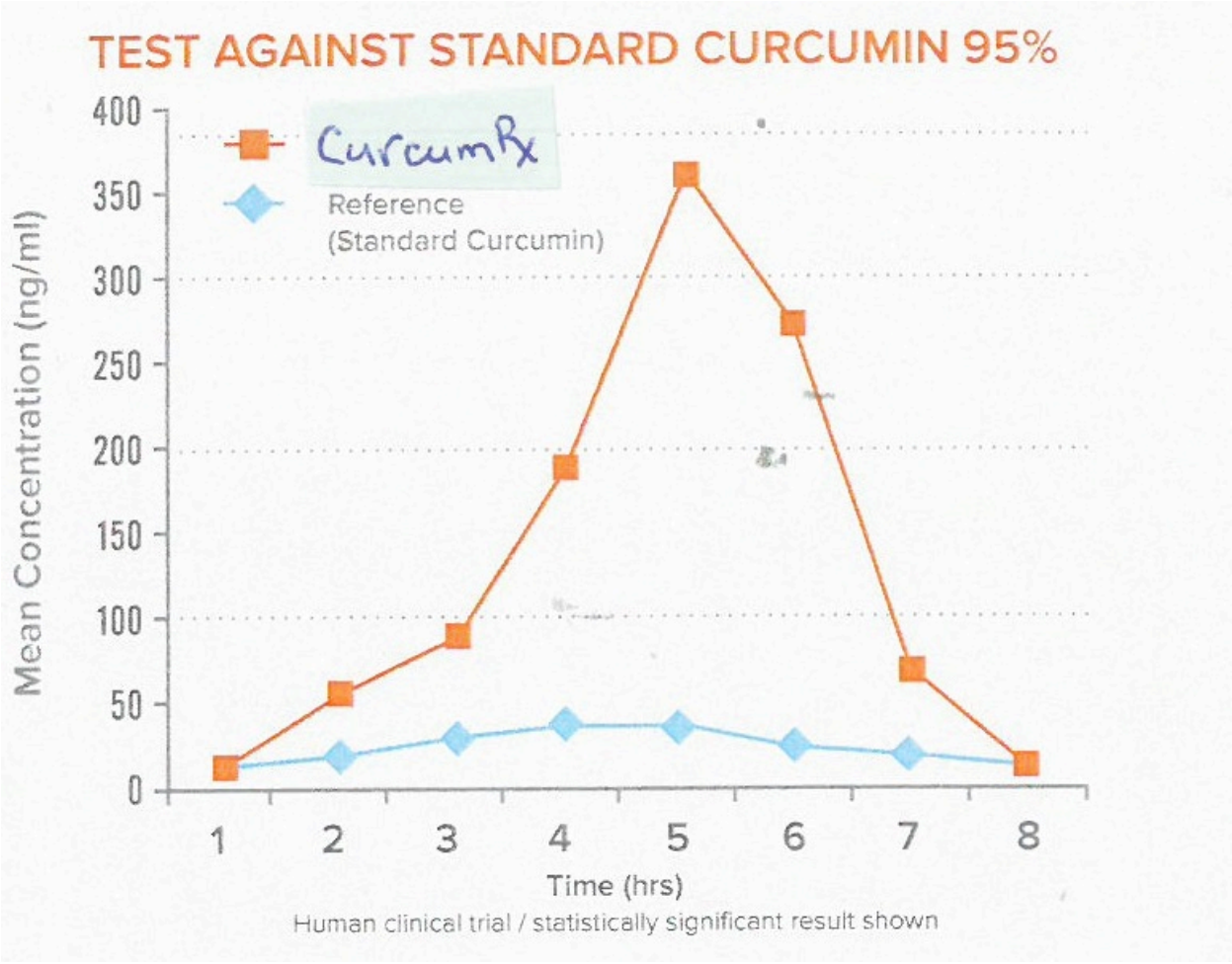
Brand	Curcumin	Material	Cmax	Cmax/mg	AUC	AUC/mg	Reference
	Dose (mg)	Dose (mg)	ng/ml	curcumin	(ng-ml/hr)	Curcumin	
Curcum Rx	232.5	500	170	0.731	825	3.54	Gopi
CurQfen	250	97.7	341	3.42	963	3.85	Kumar
Meriva	99	500	70	0.707	187	1.89	Gopi
Theracumin	30	300	29.5	0.983	113	3.76	Sasaki
CAVAmax	376	2685	70	0.186	327	0.870	Purpura
BCM-95	429.5	500	46	0.107	117	0.27	Gopi
Curcuwin	376	1880	34.9	0.093	380	1.01	Jager
Bioperine	2000	20mg piperine	180	0.090	80	0.04	Shoba
Longvida	650	2000	22.4	0.035	95	0.146	Gota

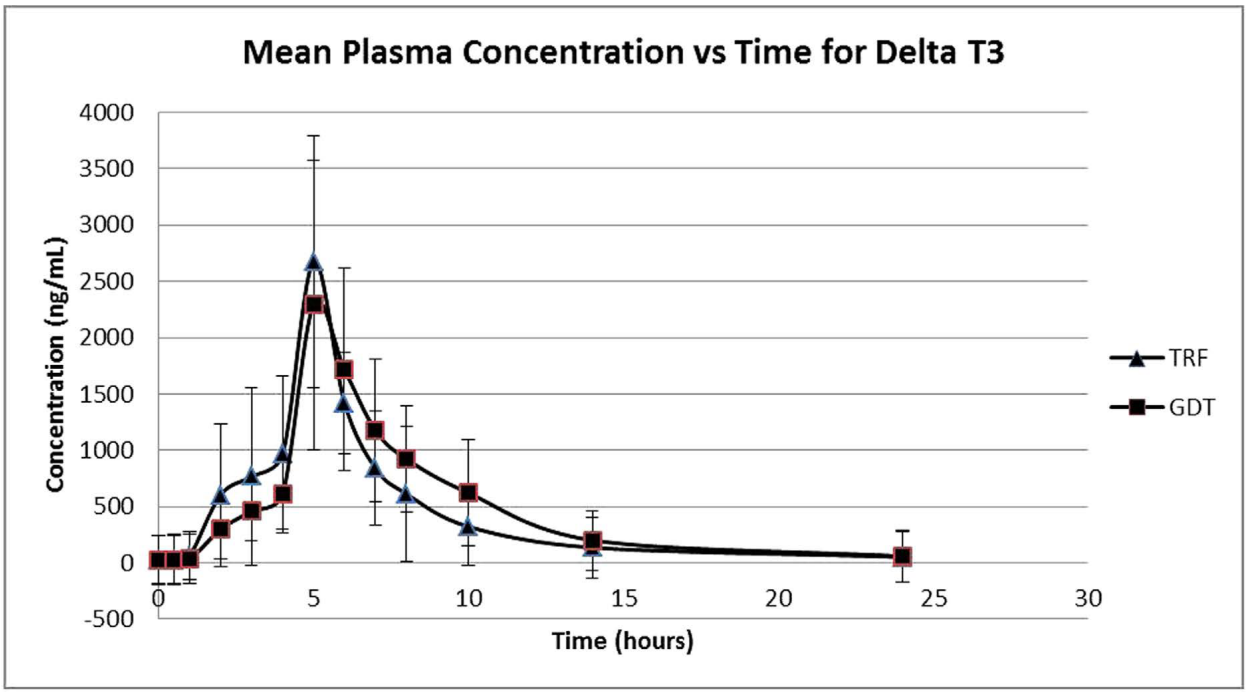
CurcumRx and CurQfen show similar total absorption per milligram (gm). However, the CurQfen shows a peak absorption at one hour and the CurcumRx shows a peak at three hours.

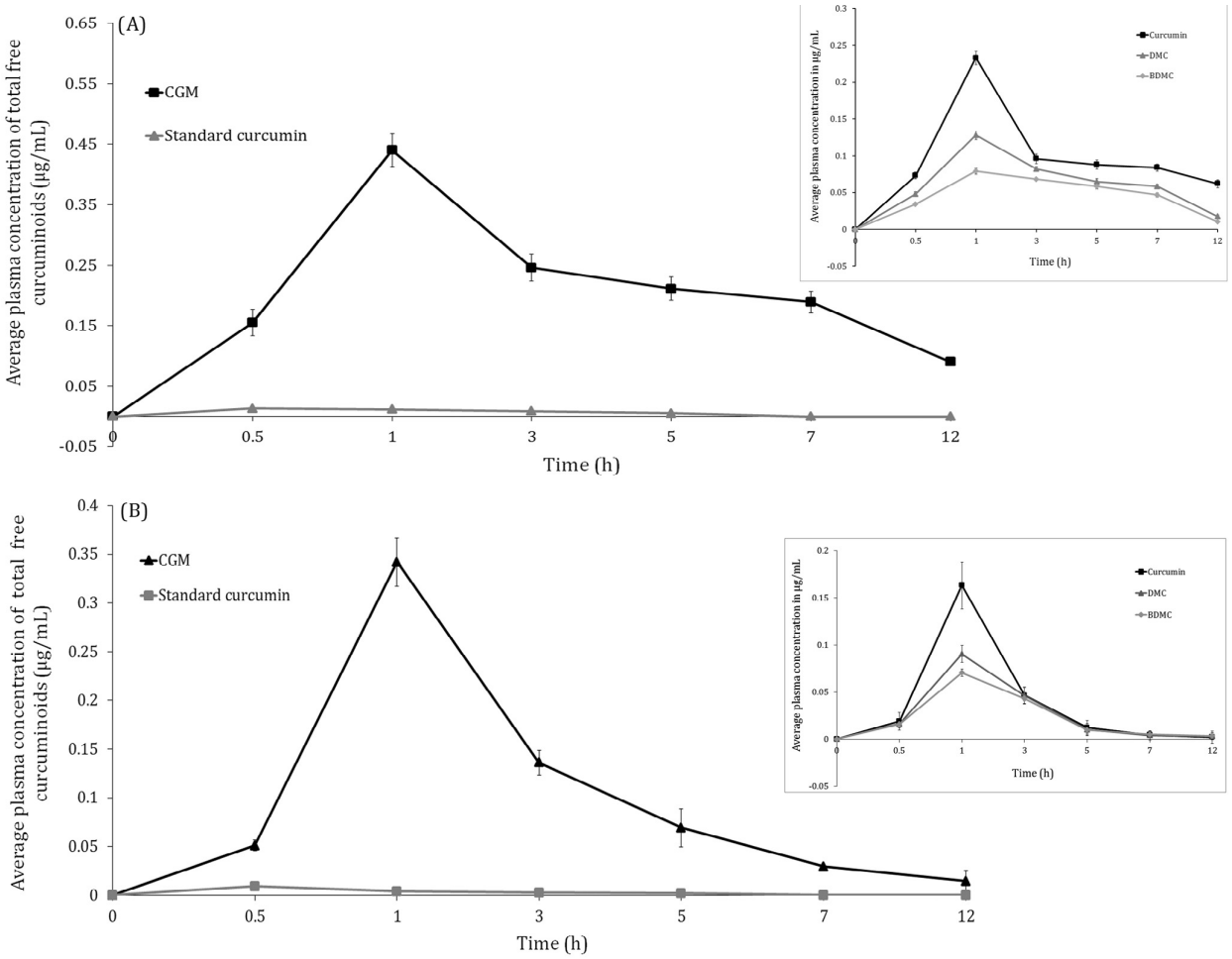
CurcumRx exhibits antioxidant capacity similar to vitamin C by a standard DPPH free radical assay method which Biotics Research also uses to standardize free radical quenching by antioxidant compounds (S. Gopi, et al 2017 Materials Science and Engineering). We will need to do this assay in house.

It is expected that both processes can result in oil particles of curcumin that are able to pass through the barriers of the intestinal membrane.

The absorption of delta tocotrienol is presented below. Vitamin E compounds are known to be absorbed lymphatically. As such they will peak later in the blood. The peak absorption is very similar to CurcumRx and suggests that CurcumRx may be absorbed lymphatically. To date that are no lymphatic studies on curcumin and the lymphatic system. I have contacted various researchers doing turmeric research and have asked for any findings in this area without any success.


TEST AGAINST STANDARD CURCUMIN 95%
CurcumRx
Reference
(Standard Curcumin)
Mean Concentration (ng/ml)
400
350
300
250
200
150
100
50
0
1
2
3
4
5
6
7
8
Time (hrs)
Human clinical trial / statistically significant result shown


Mean Plasma Concentration vs Time for Delta T3
Concentration (ng/mL)
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0
5
10
15
20
25
30
Time (hours)
TRF
GDT



Top chart is the absorption in humans using CurQfen 1000 mg containing 391 mg of curcuminoids . The bottom chart is the absorption using CurQfen 250 mg containing 97.7 mg of curcuminoids. (Ref Kumar et al, Journal of Functional Foods 21 (2016) 578-587).

What is puzzling is that the CurQfen large dose is four times (4x) the smaller dose yet the absorption max in only one and half times (1.5X) the smaller dose. This implies that is a limited absorption of that product for some reason. This has not been reported for CurcumRx. More studies are needed in the future.

The last chart is what you expect to see with increasing dosage of an oily nutrient such as vitamin D3.

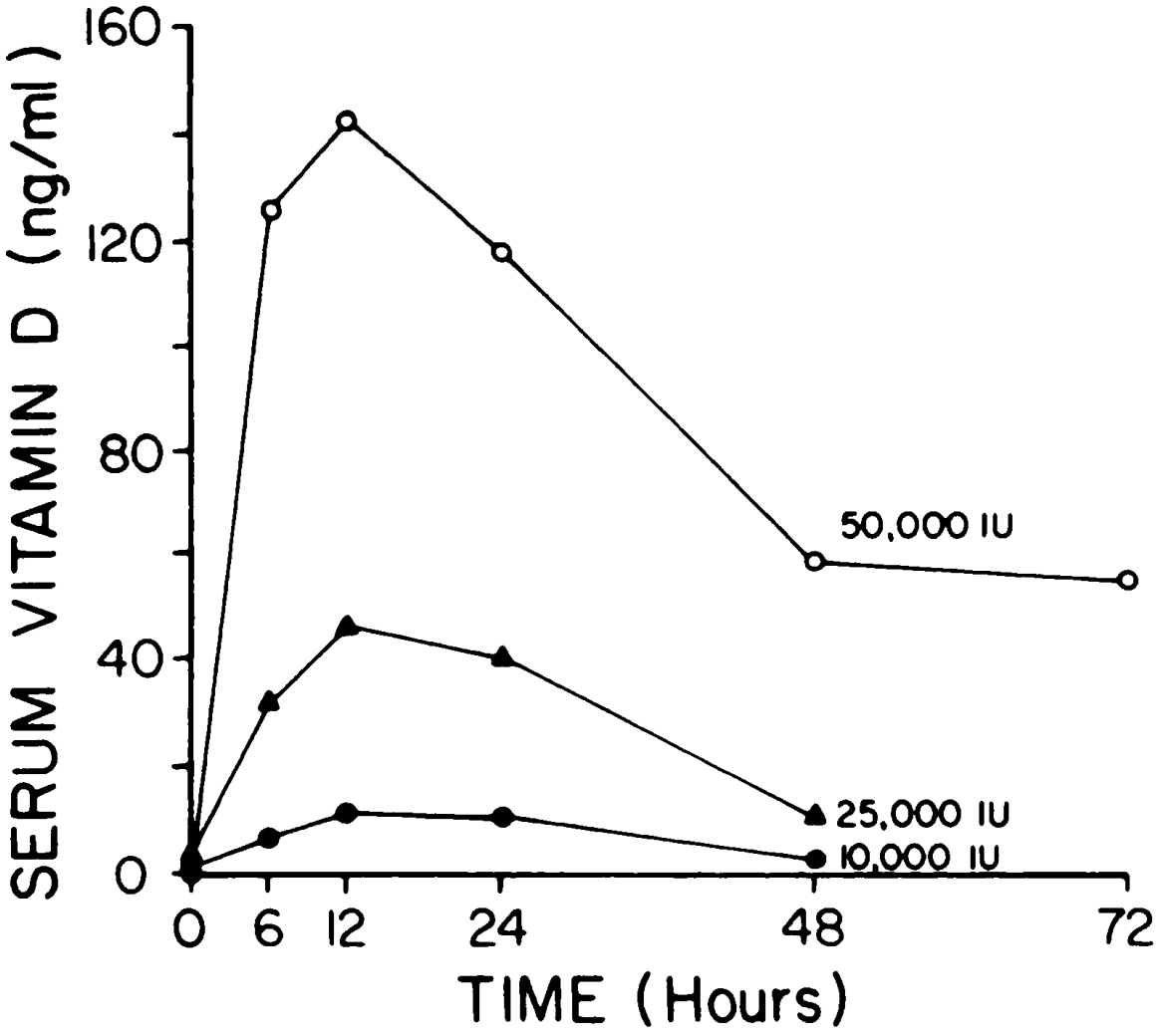


FIG 1. Serum vitamin D concentrations in a normal control subject after 50.000 IU (— ○ —), 25,000 IU (— ▲ —), and 10,000 IU (— ● —) of vitamin D_2 in 100% ethanol, evaporated on toast.